CLAIMS

1. A fuel cell system comprising:

a fuel cell to be supplied with a gas for power generation, the gas unused for the power generation to be discharged out of the fuel cell;

a circulation flow path through which the gas discharged out of the fuel cell is resupplied to the fuel cell;

a variable flow rate circulation pump for circulating the gas through the circulation flow path;

a valve for discharging the gas in the circulation flow path to the outside of the circulation flow path;

a voltage sensor for measuring voltage of the fuel cell; and

a controller for controlling the circulation pump and the valve,

wherein the circulation pump and the valve are controlled based on the voltage measured by the voltage sensor.

2. The fuel cell system of claim 1, wherein

the fuel cell comprises a plurality of cells stacked on one another, and the voltage sensor measures voltages of the respective cells, and wherein

the circulation pump is controlled to reduce flow rate of the gas circulated, and the valve is controlled to increase an amount of gas to be discharged, as the number of cells with substantial voltage drops increases.

3. The fuel cell system of claim 1, wherein

the fuel cell comprises a plurality of cells stacked on one another, and the voltage sensor measures voltages of the respective cells, and wherein

the circulation pump is controlled to reduce flow rate

of the gas circulated, and the valve is controlled to increase an amount of gas to be discharged, as a variation in the measured voltages between the cells becomes smaller.

4. The fuel cell system of claim 1, further comprising:

a clogging detector for determining possibility of clogging of a gas passage in the fuel cell,

wherein the circulation pump is controlled to reduce flow rate of the gas circulated, and the valve is controlled to increase an amount of gas to be discharged, as the possibility of the clogging is determined to be low.

5. The fuel cell system of claim 4, wherein

the fuel cell comprises a plurality of cells stacked on one another, and the voltage sensor measures voltages of the respective cells, and wherein

the possibility of clogging is determined to be lower, as the number of cells with substantial voltage drops increases.

6. The fuel cell system of claim 4, wherein

the fuel cell comprises a plurality of cells stacked on one another, and the voltage sensor measures voltages of the respective cells, and wherein

the possibility of clogging is determined to be lower, as a variation in the measured voltages between the cells becomes smaller.

7. The fuel cell system of claim 1, wherein

the valve is controlled to increase an amount of gas to be discharged, as a rate of increase in the measured voltage is low, after the circulation pump is controlled to increase flow rate of the gas circulated more than that in a normal operation.

8. A method for improving fuel gas consumption in power

generation of fuel cells, wherein the fuel gas unused for the power generation is resupplied to the fuel cells through a fuel gas circulation system, the method comprising:

monitoring output voltages of the respective fuel cells;

increasing flow rate of the fuel gas in the fuel gas circulation system, if variation in the output voltages is larger than a predetermined range; and

discharging the fuel gas out of the fuel gas circulation system, if the variation in the output voltages is within the predetermined range and an average value of the output voltages of the respective fuel cells is lower than a predetermined value.